FIG. 1

ATGCCCAAGCGCGCGCACTGGGGGGCCCTCTCCGTGGTGCTGATCCTGCTTTGGGGCCATCCGCGAGTGGCGCTGCCCGCATCCTTGTGCCT GCTACGTCCCCAGCGAGGTCCACTGCACGTTCCGATCCCTGGCTTCCGTGCCCGCTGGCATTGCTAGACACGTGGAAAGAATCAATTTGGGGTTTAA TAGCATACAGGCCCTGTCAGAAACCTCATTTGCAGGACTGACCAAGTTGGAGCTACTTATGATTCACGGCAATGAGATCCCCAAGCATCCCCGATGGA GCTTTAAGAGACCTCAGCTCTCTCAGGTTTTCAAGTTCAGCTACAACAAGCTGAGAGTGATCACAGGACAGACCCTCCAGGGTCTCTCTAACTTAA $\tt CCTCCACCAGCTGCACCCCAGCACCTTCTCCACGTTCACATTTTTGGATTATTTCAGACTCTCCACCATAAGGCACCTCTACTTAGCAGAGAACATG$ GTTAGAACTCTTCCTGCCAGCATGCTTCGGAACATGCCGCTTCTGGAGAATCTTTACTTGCAGGGAAATCCGTGGACCTGCGATTGTGAGATGAGAT ${\tt GGTTTTTGGAATGGGATGCAAAATCCAGAGGAATTCTGAAGTGTAAAAAGGACAAAGCTTATGAAGGCGGTCAGTTGTGCCAATGTGCTTCAGTCC}$ AAAGAAGTTGTACAAACATGAGATACACAAGCTGAAGGACATGACTTGTCTGAAGCCTTCAATAGAGTCCCCTCTGAGACAGAACAGGAGCAGGAGCA ACGAGCACGGGAACATGGTGAACTTGGTCTGTGACATCAAGAAACCAATGGATGTGTACAAGATTCACTTGAACCAAACGGATCCTCCAGATATTGA ${\tt CATAAATGCAACAGTTGCCTTGGACTTTGAGTGTCCAATGACCCGAGAAAACTATGAAAAGCTATGGAAATTGATAGCATACTACAGTGAAGTTCCC}$ ${\tt GCTCCATCCTGAAAGCGCCCATGGATGACCCAGACAGCAAGTTCTCCATTCTCAGCAGTGGCTGACGATCCATGCATCCATGGAGCCATCTGACTCCATTCTCACTC$ GACACAGTGACAATTGGCAAGAACCCAGGGGAGTCGGTGACATTGCCTTGCAATGCTTTAGCAATACCCGAAGCCCACCTTAGCTGGATTCTTCCAA ACAGAAGGATAATTAATGATTTGGCTAACACATCACATGTATACATGTTTGCCAAATGGAACTCTTTCCATCCCAAAGGTCCAAGTCAGTGATAGTGG TTACTACAGATGTGTGGCTGTCAACCAGCAAGGGGCAGACCATTTTACGGTGGGAATCACAGTGACCAAGAAAGGGTCTGGCTTGCCATCCAAAAGA GGCAGACGCCCAGGTGCAAAGGCTCTTTCCAGAGTCAGAGAAGACATCGTGGAGGATGAAGGGGGCTCGGGCATGGGAGATGAAGAGAACACTTCAA GGAGACTTCTGCATCCAAAGGACCAAGAGGTGTTCCTCAAAACAAAGGATGATGCCATCAATGGAGACAAGAAAGCCAAGAAAGGGAGAAAGACACAGAAAGCCT ${\tt CAGATTAATCCGGAGCGCTGGGCTGATATTTTAGCCAAAGTCCGTGGGAAAAATCTCCCTAAGGGCACAGAAGTACCCCCGTTGATTAAAACCACAA}$ CTTGTTGAACCTGAAGTAACAAGCACACCTCTGGAGGAAGTTGTTGATGACCTTTCTGAGAAGACTGAGGAGATAACTTCCACTGAAGGAGACCTGA ${\tt GACGCAACAGAGGGTTGGTCTGCAGCAGATGTTGGATCGTCACCAGAGCCCACATCCAGTGAGTATGAGCCTCCATTGGATGCTGTCTCCTTGGCT}$ GAGTCTGAGCCCATGCAATACTTTGACCCAGATTTGGAGACTAAGTCACAACCAGATGAGGATAAGATGAAAGAAGACACCTTTGCACACCTTACTC AGGACTGACAGACAACATCCACCTTGTGAAAAGTAGTCTAAGCACTCAAGACACCTTACTGATTAAAAAGGGTATGAAAGAGATGTCTCAGACACTA TGGGTATAATGAGCAGTATGTCTCCAGTTAAGAAGCCTGCGGAAACCACAGTTGGTACCCTCCTAGACAAAGACACCACAACAGTAACAACAACACCC AAGGCAAAAAGTTGCTCCGTCATCCACCATGAGCACTCACCCTTCTCGAAGGAGACCCAACGGGAGAAGGAGATTACGCCCCAACAAATTCCGCCAC AGAGTTCTCTGGTTCCTACAGCTTGGGTGGATAACACAGTTAATACCCCCAAACAGTTGGAAATGGAGAAGAATGCAGAACCCACATCCAAGGGAAC GAAAATAAACATAGAAACTTGTTACTCCCAGTTCAGAAACTATACTTTTGCCTAGAACTGTTTCTCTGAAAACTGAGGGCCCTTATGATTCCTTAG ATTACATGACAACCACCAGAAAAATATATTCATCTTACCCTAAAGTCCAAGAGACACTTCCAGTCACATATAAACCCACATCAGATGGAAAAGAAAT TACAGACAGACATACCTGTTACCACTTCTGGGGAAAATCTTACAGACCCTCCCCTTCTTAAAGAGCTTGAGGATGTGGATTTCACTTCCGAGTTTTT GTCCTCTTTGACAGTCTCCACACCATTTCACCAGGAAGAAGCTGGTTCTTCCACAACTCTCTCAAGCATAAAAGTGGAGGTGGCTTCAAGTCAGGCA GAAACCACCACCACTGATCAAGATCATCTTGAAACCACTGTGGCTATTCTCCTTTCTGAAACTAGACCACAGAATCACACCCCTACTGCCCGGA TGAAGGAGCCAGCATCCTCGTCCCCATCCACAATTCTCATGTCTTTGGGACAAACCACCACCACTAAGCCAGCACTTCCCAGTCCAAGAATATCTCA AGCATCTAGAGATTCCAAGGAAAATGTTTTCTTGAATTATGTGGGGAATCCAGAAACAGAAGCAACCCCAGTCAACAATGAAGGAACACAGCATATG GTCTACCACGTGGCCCAGATAGCCAACGCCAGGATGGAAGAGTTCATGCTTCTCATCAACTAACCAGAGTCCCTGCCAAACCCATCCTACCAACAGC AACAGTGAGGCTACCTGAAATGTCCACACAAAGCGCTTCCAGATACTTTGTAACTTCCCAGTCACCTCGTCACTGGACCAACAAACCGGAAATAACT ACATATCCTTCTGGGGCTTTGCCAGAGAACAACAGTTTACAACTCCAAGATTATCAAGTACAACAATTCCTCTCCCATTGCACATGTCCAAACCCA $\texttt{GCATTCCTAGTAAGTTTACTGACCGAAGAACTGACCAATTCAATGGTTACTCCAAAGTGTTTGGAAATAACAACATCCCTGAGGCAAGAAACCCAGT$ AGGCAACAGGAAAACCAAAGCCTTTCGTTACTTGGACAAAGGTTTCCACAGGAGCTCTTATGACTCCGAATACCAGGATACAACGGTTTGAGGTTCT $\tt GTCTTGCTTTCGGTCACCGTGCAGCAACCTCAAATCCTAGCCTCCCACTACCAGGACGTCACTGTCTACCTGGGAGACACCATTGCAATGGAGTGTC$ GTGCAGCTGAACGTGCAGCGTGCAGCCAACGCGCGCATCACGGGCACCTCCCCGCGGAGGACGTCAGGTACGGAGGAACCCTCAAGCTGG

GGTGTTTGCCAATGGGACCCTGGTGGTGAAATCAGTGACGGACAAAGATGCCGGAGATTACCTGTGCGTAGCTCGAAATAAGGTTGGTGATGACTAC GTGGTGCTCAAAGTGGATGTGGTGATGAAACCGGCCAAGATTGAACACAAGGAGGAGAACGACCACAAAGTCTTCTACGGGGGTGACCTGAAAGTGG ACTGTGTGGCCACCGGGCTTCCCAATCCCGAGATCTCCTGGAGCCTCCCAGACGGGAGTCTGGTGAACTCCTTCATGCAGTCGGATGACAGCGGTGG ${\tt GGGGCAGTCGGAAACTGATTGACTGCAAAGCTGAAGGCATCCCCACCCCGAGGGTGTTATTGGGCTTTTTCCCGAGGGTGTGGTTCTGCCAGCTCCATA}$ $\tt CTATGGAAACCGGATCACTGTCCATGGCAACGGTTCCCTGGACATCAGGAGTTTGAGGAAGAGCGACTCCGTCCAGCTGGTATGCATGGCACGCAAC$ GAGGGAGGGGAGGCGAGGTTGATCGTGCAGCTCACTGTCCTGGAGCCCATGGAGAAACCCATCTTCCACGACCCGATCAGCGAGAAGATCACGGCCA TGGCGGGCCACACCATCAGCCTCAACTGCTCTGCCGCGGGGACCCCGACACCCAGCCTGGTGTGGGTCCTTCCCAATGGCACCGATCTGCAGAGTGG ACAGCAGCTGCAGCGCTTCTACCACAAGGCTGACGGCATGCTACACATTAGCGGTCTCCTCGGTGGACGCTGGGGCCTACCGCTGCGTGGCCCGC TACGGCCCTTCGGTCACCAGCATCCCCGTGATTGTGATCGCCTATCCTCCCCGGATCACCAGCGAGCCCACCCCGGTCATCTACACCCGGCCCGGGA ${\tt ACACCGTGAAACTGAACTGCATGGCTATGGGGATTCCCAAAGCTGACATCACGTGGGAGTTACCGGATAAGTCGCATCTGAAGGCAGGGGTTCAGGC$ TCGTCTGTATGGAAACAGATTTCTTCACCCCCAGGGATCACTGACCATCCAGCATGCCACAGAGAGATGCCGGCTTCTACAAGTGCATGGCAAAA AACATTCTCGGCAGTGACTCCAAAACAACTTACATCCACGTCTTCTGAAATGTGGATTCCAGAATGATTGCTTAGGAACTGACAACAAAGCGGGGTT ${\tt TGTAAGGGAAGCCAGGTTGGGGAATAGGAGCTCTTAAATAATGTGTCACAGTGCATGGTGGCCTCTGGTGGGTTTCAAGTTGAGGTTGATCTTGATC$ ${ t ATTCAGGGTGTCTGTGCTGACTGCAATTTTTCTTTTTGCAAATGCCACTCGACTGCCTTCATAAGCGTCCATAGGATATCTGAGGAACATTCA$ TCAAAAATAAGCCATAGACATGAACAACACCTCACTACCCCATTGAAGACGCATCACCTAGTTAACCTGCTGCAGTTTTTACATGATAGACTTTGTT A TATATTTTAATTCAGAGTTACATACAGCTACCATTTTATATGAAAAAAGAAAACATTTCTTCCTGGAACTCACTTTTTATATAATGTTTTATATATATATTTTTTCCTTTCAAATCAGACGATGAGACTAGAAGGAGAAATACTTTCTGTCTTATTAAAATTAATAAATTATTGGTCTTTACAAGACT AACTGCATCATAACTTTACAGAATTGAATCTAGAGTCTTCCCCGAAAAGCCCAGAAACTTCTCTGCAGTATCTGGCTTGTCCATCTGGTCTAAGGTG

FIG. 2

 ${ t MPKRAHWGALSVVLILLWGHPRVALACPHPCACYVPSEVHCTFRSLASVPAGIARHVERINLGFNSIQALSETSFAGLTKLELLMIHGNEIPSIPDG$ ${ t ALRDLSSLQVFKFSYNKLRVITGQTLQGLSNLMRLHIDHNKIEFIHPQAFNGLTSLRLLHLEGNLLHQLHPSTFSTFTFLDYFRLSTIRHLYLAENM$ VRTLPASMLRNMPLLENLYLQGNPWTCDCEMRWFLEWDAKSRGILKCKKDKAYEGGQLCAMCFSPKKLYKHEIHKLKDMTCLKPSIESPLRQNRSRS IEEEQEQEEDGGSQLILEKFQLPQWSISLNMTDEHGNMVNLVCDIKKPMDVYKIHLNQTDPPDIDINATVALDFECPMTRENYEKLWKLIAYYSEVP VKLHRELMLSKDPRVSYQYRQDADEEALYYTGVRAQILAEPEWVMQPSIDIQLNRRQSTAKKVLLSYYTQYSQTISTKDTRQARGRSWVMIEPSGAV QRDQTVLEGGPCQLSCNVKASESPSIFWVLPDGSILKAPMDDPDSKFSILSSGWLRIKSMEPSDSGLYQCIAQVRDEMDRMVYRVLVQSPSTQPAEK ${\tt DTVTIGKNPGESVTLPCNALAIPEAHLSWILPNRRIINDLANTSHVYMLPNGTLSIPKVQVSDSGYYRCVAVNQQGADHFTVGITVTKKGSGLPSKR$ ${\tt GRRPGAKALSRVREDIVEDEGGSGMGDEENTSRRLLHPKDQEVFLKTKDDAINGDKKAKKGRRKLKLWKHSEKEPETNVAEGRRVFESRRRINMANK}$ QINPERWADILAKVRGKNLPKGTEVPPLIKTTSPPSLSLEVTPPFPAVSPPSASPVQTVTSAEESSADVPLLGEEEHVLGTISSASMGLEHNHNGVI ESEPMQYFDPDLETKSQPDEDKMKEDTFAHLTPTPTIWVNDSSTSQLFEDSTIGEPGVPGQSHLQGLTDNIHLVKSSLSTQDTLLIKKGMKEMSQTL ${\tt QGGNMLEGDPTHSRSSESEGQESKSITLPDSTLGIMSSMSPVKKPAETTVGTLLDKDTTTVTTTPRQKVAPSSTMSTHPSRRRPNGRRRLRPNKFRH$ $\verb"RHKQTPPTTFAPSETFSTQPTQAPDIKISSQVESSLVPTAWVDNTVNTPKQLEMEKNAEPTSKGTPRRKHGKRPNKHRYTPSTVSSRASGSKPSPSP"$ ${\tt ENKHRNIVTPSSETILLPRTVSLKTEGPYDSLDYMTTTRKIYSSYPKVQETLPVTYKPTSDGKEIKDDVATNVDKHKSDILVTGESITNAIPTSRSL$ ${ t VSTMGEFKEESSPVGFPGTPTWNPSRTAQPGRLQTDIPVTTSGENLTDPPLLKELEDVDFTSEFLSSLTVSTPFHQEEAGSSTTLSSIKVEVASSQA$ ${\tt ETTTLDQDHLETTVAILLSETRPQNHTPTAARMKEPASSSPSTILMSLGQTTTTKPALPSPRISQASRDSKENVFLNYVGNPETEATPVNNEGTQHM$ ${\tt SGPNELSTPSSDRDAFNLSTKLELEKQVFGSRSLPRGPDSQRQDGRVHASHQLTRVPAKPILPTATVRLPEMSTQSASRYFVTSQSPRHWTNKPEIT$ ${\tt TYPSGALPENKQFTTPRLSSTTIPLPLHMSKPSIPSKFTDRRTDQFNGYSKVFGNNNIPEARNPVGKPPSPRIPHYSNGRLPFFTNKTLSFPQLGVT$ ${\tt RRPQIPTSPAPVMRERKVIPGSYNRIHSHSTFHLDFGPPAPPLLHTPQTTGSPSTNLQNIPMVSSTQSSISFITSSVQSSGSFHQSSSKFFAGGPPA$ ${\tt SKFWSLGEKPQILTKSPQTVSVTAETDTVFPCEATGKPKPFVTWTKVSTGALMTPNTRIQRFEVLKNGTLVIRKVQVQDRGQYMCTASNLHGLDRMV$ t VLLSVTVQQPQILASHYQDVTVYLGDTIAMECLAKGTPAPQISWIFPDRRVWQTVSPVESRITLHENRTLSIKEASFSDRGVYKCVASNAAGADSLA $\tt IRLHVAALPPVIHQEKLENISLPPGLSIHIHCTAKAAPLPSVRWVLGDGTQIRPSQFLHGNLFVFPNGTLYIRNLAPKDSGRYECVAANLVGSARRT$ VQLNVQRAAANARITGTSPRRTDVRYGGTLKLDCSASGDPWPRILWRLPSKRMIDALFSFDSRIKVFANGTLVVKSVTDKDAGDYLCVARNKVGDDY VVLKVDVVMKPAKIEHKEENDHKVFYGGDLKVDCVATGLPNPEISWSLPDGSLVNSFMQSDDSGGRTKRYVVFNNGTLYFNEVGMREEGDYTCFAEN QVGKDEMRVRVKVVTAPATIRNKTYLAVQVPYGDVVTVACEAKGEPMPKVTWLSPTNKVIPTSSEKYQIYQDGTLLIQKAQRSDSGNYTCLVRNSAG EDRKTVWIHVNVQPPKINGNPNPITTVREIAAGGSRKLIDCKAEGIPTPRVLWAFPEGVVLPAPYYGNRITVHGNGSLDIRSLRKSDSVQLVCMARN ${\tt EGGEARLIVQLTVLEPMEKPIFHDPISEKITAMAGHTISLNCSAAGTPTPSLVWVLPNGTDLQSGQQLQRFYHKADGMLHISGLSSVDAGAYRCVAR$ ${ t NAAGHTERLVSLKVGLKPEANKQYHNLVSIINGETLKLPCTPPGAGQGRFSWTLPNGMHLEGPQTLGRVSLLDNGTLTVREASVFDRGTYVCRMETE$ ${\tt YGPSVTSIPVIVIAYPPRITSEPTPVIYTRPGNTVKLNCMAMGIPKADITWELPDKSHLKAGVQARLYGNRFLHPQGSLTIQHATQRDAGFYKCMAK}$ NILGSDSKTTYIHVF

FIG

Levels of Adlican mRNA in human cartilage by RT-PCR	OA NA	3G12	Actin * * * * * * * * * * * * * * * * * * *	

FIG.

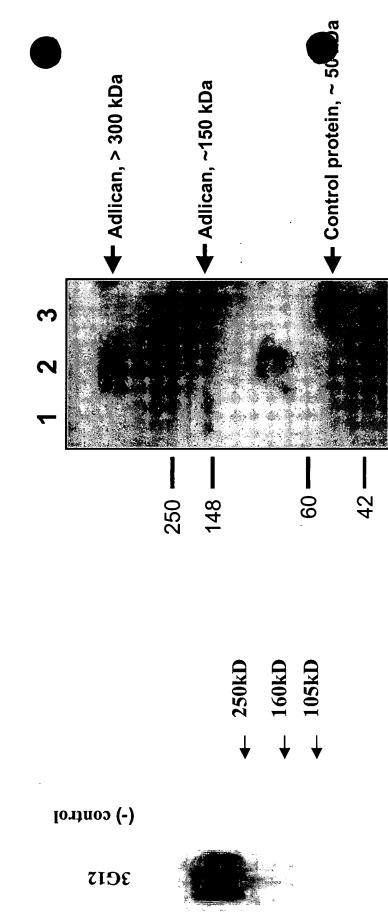


FIG. 6

